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Facilitating Interaction in Computer Mediated Online Courses

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Introduction

As Cj Baehr (1995, p.11) remarked, "My expectation is that, though we have a clear goal, our course through the session will be guided by you who attend the session, and most of what happens here will be in the form of responses to one another. . . In this session we will all be speaking, listening, responding, considering, and making group decisions about how to proceed. It will not be chaos, but it is difficult to describe ahead of time." So I will outline here what we will do and provide the background and introductory material that is best conveyed on paper (or CD-ROM in this case).

Depending on audience size and how many audience members have been students/teachers online, we will pose questions focused toward the scope of this presentation: teaching methods and techniques to foster interaction (process) and collaboration (product) among students and teachers online. If at least half the participants are familiar with online environments (email, discussion groups, computer conferences), we will first ask them to compare and contrast face-to-face teaching and online facilitation techniques and determine what is likely to be good practice in both venues. We will ask some of those who have taught online to share their best and worst experiences, and what they learned from each.

If few have taught online, we will ask them to form small groups and report on the following questions: Given the nature of computer mediated conferencing, and thinking about what constitutes good fact-to-face classroom practice, what teacher activities and attitudes might promote interaction? What activities and attitudes might stifle or discourage interaction? Before the presenters reveal their thoughts, the audience will be asked to share their own experiences. The presenters will focus them on the theme of the presentation. We will relate participants' findings to what good facilitation practice is in Cyberspace.

This paper contains background material for the discussions. First we will give a brief introduction to computer conferencing (CC), somewhat generically and look at both the advantages and the disadvantages of the various "flavors" of computer conferencing. You have to know your tools before you can use them. We will then look at interaction in online learning environments, the changing roles of teachers and students and the role of the online conference tutor/moderator/facilitator. This paper concludes with an extensive bibliography.

Computer Conferencing

Computer-mediated Communication

When we talk about computer mediated communication (CMC) it is in the sense of an umbrella term that subsumes computer based instruction, informatics and human-to-human communication in the form of email and computer conferences (Santoro, in press). In computer based instruction, the computer (networked or otherwise) assumes the role of patient teacher or tutor, often on a one-to-one basis, often using highly structured and previously prepared course materials. Informatics has the computer-as-client, used as a means of accessing data internally from its own data storage media, or, in a networked setting, from remote databases like online public-access library catalogs or external file servers and archives using client programs like ftp, telnet,archie, gopher, or any one of the World Wide Web browsers.

The third emphasis within CMC spotlights the various types of computer conferencing with the computer in its role as interpersonal communication device, used synchronously or asynchronously to connect human beings to each other. This can be via email and mailing lists or computer conferencing systems (which may include email and synchronous communications in their text-based, asynchronous environments). We will use the term "computer conference" in a fairly generic sense in this paper to encompass a full range of human-to-human computer mediated interactions.

Computer Conferencing

Computer conferencing can be looked at from a number of different perspectives. In one principal form of computer conferencing, the transactions are carried out asynchronously by electronic mail that arrives in, and is sent from, the participant's mailbox. Examples of this are plain email, and computer conferencing conducted via mailing lists running under Listserv, Majordomo, Listproc or some other mailing list management software. When email and email mailing lists are used for computer conferencing, the participant receives in their mailbox a constant stream of reminders that the conference is proceeding. This opens the possibility of mailboxes filled to overflowing if the conference members are "talkative" and mail is not checked frequently. Most users are familiar with their own electronic mail systems and, in the case of a conference that extends over many sites, there are personnel at each site who can provide training and support for their site's users. Participants are expected to be proactive in sorting and storing the messages themselves and may have difficulties coping with discussions that are attenuated over time (Romiszowski & de Haas, 1989).

The other principle form of CC requires the participant to log into the computer or network on which the computer conference software resides. The most ubiquitous form of bulletin board (BBS) conferencing is Usenet Netnews and privately established Netnews groups are often used as a form of conferencing software. This conference format stores all the messages in a single, central location and participants must log onto the system or use a client program to read them. All messages are listed with the subject line showing so participants can choose to read them all sequentially or read them in groups of messages with a particular subject line. This relieves the participant of having to sort and store the messages themselves.

"Main-frame" conferencing systems like VaxNotes and CoSy are text-based and are elaborations on the bulletin board concept, with separate areas for separate topics, (or "threads"), and they sometimes include electronic mail and synchronous communication within the conferencing program. Sophisticated groupware programs like LotusNotes allow even more features, with conference members being able to work on documents simultaneously and the program supports group decision making. As computer conferencing software increases in sophistication, so does the users' learning curve, the sophistication of the hardware needed to mount and access the conference, and the cost of supporting both software and users.

Synchronous and Asynchronous Conferencing

Synchronous computer conferencing takes the form of interactive messaging systems like "internet relay chat (IRC)", the "chat rooms" on most of the commercial internet access providers; and the increasingly popular MUDs/MOOs/MAUDs. All participants must be present online at the same time in order to interact and when many people do so, the text on the screen can scroll along at a furious pace, with the discussion having much of the flexibility of the spoken word. Careful classroom management can mitigate some of the problem by establishing protocols for who can talk when and to whom. While a transcript of the proceedings can be accessed later for those who can't read fast enough or miss a scheduled discussion period, this medium favors those who can read and absorb information quickly, hold multiple discussion threads in their heads at the same time, type with some accuracy and speed and be present, despite the difference in time, across national and international time zones.

Asynchronous computer conferencing can run the gamut from simple email discussions between individuals that require only that the participants have access to an electronic mailbox to feature-rich groupware programs like LotusNotes, which run on mainframes or dedicated servers that one must log into. Participants do not have to be online at the same time in order to interact and can do so from any location from which they have access to a networked computer with the appropriate client program (which may be just Telnet).

Access

Theoretically computer conferencing is available 24 hours a day, but this is mitigated by the participant's ability to access that networked computer, or the availability of a dial-up modem connection. Instant responses are rarely required when one is working asynchronously, so students do have time to think and reflect on their responses, if that is their chosen learning style. Online instructors also need to set reasonable time limits, expecting a response in a certain number of days, to accommodate those who do not have daily access. Participants may find courses taught by computer conferencing easier to fit in around work and family responsibilities, if they have access from work or home or another convenient location. Working with an online cohort also takes some of the pacing of the course out of the participants hands. This may cause difficulties if, for instance, the participant has to travel or has other situations arise that cause absences from their studies. They can lose their place in the discussion and become discouraged.

Advantages of Computer Conferencing

The advantages of computer conferencing include interacting at a distance with other students and the instructor, rather than studying alone. A virtual community can be built that provides support and encouragement and promotes sharing among the participants and can help overcome the isolation of remote areas (Singletary and Anderson 1995; McAuley, 1995). Guest "lecturers" can be invited in to join the conference, so students can interact directly with experts in their fields (Cotlar & Shimabukuro, 1995). It can be very convenient, theoretically being available as close as the nearest telephone or modem connection. Computer conferencing can be independent of time (I often work in the early hours of the morning; and have been a guest speaker in a number of Australian computer conferences) and independent of distance (I have logged in from Australia, several Canadian locations and from an assortment of cities throughout the United States.) (For a fuller description of advantages and disadvantages, see Berge and Collins, 1993).

Disadvantages of Computer Conferencing

The disadvantages of computer conferencing start with the problems inherent in gaining reliable access to networked computer. Learning curves and time investments can be very steep and students may not experience a good return on their investment. Access to technical support is crucial as there is a multiplicity of computer and software configurations that may not necessarily communicate with each other. And just because a student has used computers in the course of their work, this does not necessarily mean that they know anything about the use of telecommunications software, nor can you assume they know how to upload and download files, nor know how to create folders in their electronic mail program in which to store incoming messages. Email appears ephemeral and commonplace and it is sometimes difficult to persuade participants to treat conference contributions as if they are "real" and "important". Where students in place-based classrooms are used to setting aside a portion of their lives for travel and attendance in scheduled classroom periods, students in computer conferences must pace themselves, remember to log in frequently and attend to their course activities.

Computer conferencing is text-based in all but a few experimental virtual reality forms. This advantages those who are literate and articulate and who can keyboard. In text-based conferences social context cues are absent and, as humans are used to the high bandwidth of face-to-face communications, this can cause problems. Misunderstandings can arise quickly and be difficult and time consuming to solve. On the other hand, stigma attached to personal appearances or handicaps is less likely to "stick" and those who cannot ordinarily communicate in a face-to-face classroom can do so in the relative anonymity of computer conferencing (Day & Batson, 1995; Kinner & Coombs, 1995; Pemberton & Zenhausern, 1995)

Integrating Computer Conferencing

Computer conferencing can be used to supplement face-to-face instruction, bring the outside world into the classroom, open the classroom to the world or replace the face-to-face classroom entirely. Where computer conferencing is not the primary method of course delivery, it is crucial to the success of the enterprise that the content of the conference be tightly and meaningfully integrated with the balance of the course and

course materials. In some distance courses this is accomplished by delivering "dense" content on recorded media (paper, audio/video tape, CD-ROM) and all the discussion of the material takes place in the computer conference with a grade attached to the student's participation. A month-long conference, for instance, used as a supplement to a place-based course where students see each other each class period may be perceived as an "exercise" with high frustration levels unless students realize that the content of the discussions is a relevant part of the course.

Interaction and Learning

There are essentially two kinds of interaction with regard to learning. One is a student individually interacting with content. The other is social activity: a student interacting with others about the content. Both types of interaction are necessary for efficient, effective and affective learning. In distance education, it is particularly important to provide an environment in which both kinds of interaction can occur. In the past the social interaction about the content has most often only been between instructor and student; but it is increasingly possible for students to interact with one another, even when geographically and temporally separated (Moore, 1989).

Interaction takes different forms: between a student and course materials; between student and learning activities/examinations; between student and instructor; among students. Each student must do something with the knowledge he or she is attempting to learn. Interacting with content means actively processing and combining this content with prior knowledge. Regarding social interaction, it is our assumption that a goal of distance teaching is to create an environment that both fosters trust among learners and the instructor and seeks to promote a cooperative and collaborative environment, allowing students to learn from course materials, the instructor and each other.

Synchronous and Asynchronous Interaction

Hand-in-hand with the principle of interaction is the assumption that learning is a social activity. That doesn't necessarily have to mean face-to-face interaction--social interaction can occur among people using phones, fax, mail, and other mediating technologies. Social interaction doesn't necessarily require real-time (synchronous) communication either. Thus, interaction among learners or instructor can be independent of time and geography.

Computer mediated communication and computer conferencing, combined with text books or readings, can provide an asynchronous setting that is independent of both time and distance and yet can provide valuable interaction opportunities for students, both with the instructor and among themselves. Online class interaction can be structured as one-to-one (email); one-to-many (Listserver managed groups) and many-to-many (bulletin boards and dedicated computer conferencing systems (CoSy, VaxNotes, Caucus, LotusNotes etc.).

Regardless of the particular delivery mechanism, computer mediated communication is interaction stripped of social context cues and human "presence", yet for learning to occur students and faculty must become familiar with the environment, and each other and be able to make both sense and meaning of the learning experienced they are engaged in.

Scaffolding for students interaction and meaning-making activities must be provided by the online instructor by modeling appropriate interaction and facilitation techniques on screen, and by providing metaphors and analogies to personalize and humanize the transactional space. To do this effectively teachers must first realize some of the basic differences between teaching face-to-face and facilitating online interactions, become themselves adept at the use of the computer conferencing technology and be aware of various teaching and facilitation techniques that are, and are not, suitable for online classrooms.

The Role of the Instructor When Teaching in the CC Environment

Clearly the most important role of the online instructor is to model effective teaching and accept "the responsibility of keeping discussions track, contribute special knowledge and insights, weave together various discussion threads and course components, and maintaining group harmony" (Rohfeld & Hiemstra, 1995, p. 91). Learning to use the technology to effectively mediate the communications process is a critical skill to be acquired early in the teaching process (Gunawardena, 1992). When teaching via computer conferencing responsibilities can be effectively shared between the instructor and the course members (Tagg, 1994).

Directly translating a place-based course into one delivered by computer conferencing may or may not work well. While it may be possible to do so with most courses, the instructional design of a course may work well with one delivery system, but not another. For instance, lectures, the staple of most place-based instruction, are particularly ineffective. In a computer conference they become screen after screen of text which, when printed out, looks like any other assigned article to be read. Creating a balance of independent, interactive and interdependent course activities, takes time--more time than most instructors ever spend on designing their face-to-face courses. This is seldom recognized by traditional faculty reward systems.

Gunawardena (1992, p. 61) decided to "do away with knowledge transmission and focus on learner-initiated inquiry and exploration." In the process, Gunawardena found:

In order to change to a learner-controlled instructional system and to maximize interaction, I had to change my role from that of a teacher at the front of the classroom and the center of the process to that of facilitator who is one with the participants and whose primary role is to guide and support the learning process. The result was a course designed as a learner-centered system based on dialogue and cooperation among students (1992, p. 61).

Changing Roles of Teachers and Students

Such a move engenders a radical shift in the power and interaction structures in the classroom as the students must accept the responsibility for their own knowledge creation, and the instructor must relinquish a certain amount of control over the process. Gunawardena (1992) had to teach herself to "let go as [she] became more satisfied with the quality of student controlled interaction and discussion" as she "realized that by emphasizing the process of learning and interaction, students would begin to interact with the content" (p. 64). She found it very difficult to give up the control she had practiced in the traditional class and found that some students had equal difficulty in taking responsibility for their own learning and required constant supported.

The following is a summary table of the changing roles of teachers and students when computer conferencing becomes a major feature of the teaching-learning experience, (Berge, 1996):

Table 1 about here

The Online Instructor's/Moderator's/Facilitator's Roles

There are many necessary conditions for successful online instruction, which Berge (1995) categorized into the following four areas: pedagogical, social, managerial, and technical. Not all of these roles need to be carried out in their entirety by the same person. In fact, it may be rare that they are. A brief description of those roles follows (Feenberg, 1986; Gulley, 1968; Kerr, 1986; McCreary, 1990; McMann, 1994; Paulsen, 1995).

Pedagogical (intellectual; task) - certainly, some of the most important roles of online discussion instructor/moderator/tutor revolves around their duties as an educational facilitator. The instructor contributes their special knowledge and insights and uses questions and probes for student responses that focus discussions on critical concepts, principles and skills. By modeling appropriate

online behaviors, the instructor can prepare students, alone or in groups, to experience moderating the conference for themselves.

Social - creating a friendly, social environment in which learning is promoted is also essential for successful online teaching. This suggests promoting human relationships, affirming and recognizing students' input; providing opportunities for students to develop a sense of group cohesiveness, maintaining the group as a unit, and in other ways helping members to work together in a mutual cause, are all critical to success of any conferencing activities.

Managerial (organizational; procedural; administrative) - This role involves setting the agenda and pacing for the conference: the objectives of the discussion, the timetable, procedural rules and decision-making norms. Meta-comments can be used to remedy problems in context, norms or agenda, clarity, irrelevance and help participants deal with information overload. Unobtrusively managing the flow and direction of the conference discussion without stifling the participants a sine qua non of successful conference facilitation.

Technical - the instructor must first themselves become comfortable and proficient with the technology and then must ensure that participants are comfortable with the system and the software that the conference is using. The ultimate technical goal for the instructor is to make the technology transparent. When this is done, the learner may concentrate on the academic task at hand.

One of the more exhaustive listings of online pedagogical techniques can be found on Morten Paulsen's World Wide Web homepage at <http://www.nki.no/~morten> as "The online report on pedagogical techniques for computer-mediated communication."

We trust that you will find this background material for the presentation discussion to be valuable. We have a deep and abiding interest in the moderator's role and ask that you send to us any references you may see are missing from the bibliography.

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Table 1: The Changing Roles of Instructors and Students

Changing Instructor Roles	Changing Student Roles
<ul style="list-style-type: none"> • From oracle and lecturer to consultant, guide, and resource provider • Teachers become expert questioners, rather than providers of answers • Teachers become designers of learning student experiences rather than just providers of content • Teachers provide the initial structure to student work, encouraging increasing self-direction • Teacher presents multiple perspectives on topics, emphasizing the salient points • From a solitary teacher to a member of a learning team (reduces isolation sometimes experienced by teachers) • From teacher having total autonomy to activities that can be broadly assessed • From total control of the teaching environment to sharing with the student as fellow learner • More emphasis on sensitivity to student learning styles • Teacher-learner power structures erode 	<ul style="list-style-type: none"> • From passive receptacles for hand-me-down knowledge to constructors of their own knowledge • Students become complex problem-solvers rather than just memorizers of facts • Students see topics from multiple perspectives • Students refine their own questions and search for their own answers • Students work as group members on more collaborative/cooperative assignments ; group interaction significantly increased • Increased multi-cultural awareness • Students work toward fluency with the same tools as professionals in their field • More emphasis on students as autonomous, independent, self-motivated managers of their own time and learning process • Discussion of students' own work in the classroom • Emphasis on knowledge use rather than only observation of the teacher's expert performance or just learning to "pass the test" • Emphasis on acquiring learning strategies (both individually and collaboratively) • Access to resources is significantly expanded